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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,775	01/31/2005	Hiroyuki Yamaoka	2005-0139A	1624

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EXAMINER	
IVEY, ELIZABETH D	

ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 06/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/522,775	YAMAOKA ET AL.	
	Examiner	Art Unit	
	Elizabeth Ivey	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13 and 14* is/are pending in the application.

4a) Of the above claim(s) *13-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I claims 1-12 in the reply filed on April 4, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

The disclosure is objected to because of the following informalities: page 4 line 19 contains a minor misspelling of the word "slope". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 5-6 and 8-12 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 2002-097013 to Minami et al.

Regarding claim 1, Minami discloses a film on a support (paragraph [0031]). The film is a composite of silica and titania microcrystals (abstract and paragraph [0013]). Minami discloses the titania microcrystals on the surface of the thin film (page 2 paragraph [0025]) which, if on the surface, would create a very steeply sloped increase (upward inclination) in microcrystal particles toward the surface layer.

Regarding claim 2, Minami discloses a possible molar ratio of SiO_2 to TiO_2 of 5:1 to 3:1 which is within the range of 99-40wt% SiO_2 as the first phase and 1-60 wt% or TiO_2 as the second phase (paragraph [0011]).

Regarding claims 5 and 6, Minami discloses titania as the second phase (paragraph [0010]).

Regarding claim 8, Minami discloses titania of the anatase type (paragraph [0013]).

Regarding claim 9, Minami discloses silica as the first phase (paragraph [0009]).

Regarding claim 10, claim 10 merely recites an intended use and, accordingly, is entitled to little or no patentable weight. However, the examiner notes that Minami discloses the thin film to exhibit a high photocatalytic activity (paragraph [0001]).

Regarding claim 11, Minami discloses the film support may be glass (paragraph [0031]).

Claims 1-7, 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,939,201 to Boire et al.

Regarding claims 1, Boire discloses a glass substrate with a layer based on silicon oxide (first phase), which becomes gradually richer in crystallized titanium oxide (second phase) (column 7 lines 40-50). Claim 1 is a product by process claim wherein the patentability of the product does not depend on its method of production. "If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." See MPEP 2113. As such, the process limitation within claim 1 does not provide patentable distinction over the prior art.

Regarding claim 2, Boire discloses a gradient layer with at least 80% SiO_2 at the with one adjacent layer and upto 80% TiO_2 at the interface of the opposing layer, allowing for a first phase (SiO_2) of between 99 and 40% by weight and a second phase (TiO_2) of between 1-60% by weight (column 15 lines 9-12).

Regarding claim 3, Boire discloses a layer thickness of at least 10 and particularly between 50-120nm allowing for the second phase to slopingly increase throughout said thickness overlapping the claimed depth (column 7 lines 53-55).

Regarding claims 4 and 7, Boire discloses the layer thicknesses to be as thin as 10nm requiring the particle diameter to be 15nm or less (column 7 lines 53-55).

Regarding claims 5 and 6, Boire discloses a second phase of titanium oxide ZrO_2, Al_2O_3, and TiN (column 6 line 63-column 7 line 7).

Regarding claim 9, Boire discloses the silicon ceramic component to be SiO_2 (column 7 line 52).

Regarding claim 10, Boire discloses the ceramic thin film has known photocatalytic properties (column 7 lines 40-50).

Regarding claim 11, Boire discloses a glass substrate (abstract and column 1 lines 5-6).

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 4 and 7 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 2002-097013 to Minami et al.

Regarding claim 4, Minami discloses a titania microcrystalline particle size of 10 to 1000nm which overlaps the range of 50nm or less diameter (page 2 paragraph [0018]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Regarding claim 7, Minami discloses a titania microcrystalline particle size of 10 to 1000nm which overlaps the range of 15nm or less diameter (page 2 paragraph [0018]). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Claim Rejections - 35 USC § 103

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2002-097013 to Minami et al.

Regarding claim 3, Minami discloses all of the limitations of claim 1 but does not expressly disclose a phase sloping increase from 5-500nm. However, it would have been obvious to a person having ordinary skill in the art to adjust the depth of the microcrystalline phase sloping to optimize the photocatalytic activity for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,939,201 to Boire et al. in view of JP 2002-097013 to Minami et al.

Boire discloses all of the limitations of claim 1 but does not expressly disclose anatase as the form of titania. Minami discloses a similar photocatalytic layer with a gradient employing the anatase form of TiO_2. Because anatase is a common form of titania and because it is used for photocatalytic purposes in a gradient layer by Minami, it would have been obvious to a person having ordinary skill in the art at the time of the invention to utilize TiO2 in the anatase form to create the gradient photocatalytic layer of Boire.

Response to Arguments

Examiner acknowledges amendment to claim 1.

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's argument that addition of the process limitations to claim 1 differentiates the instant claims over Minami, examiner notes that applicant's description of the invention in the argument is not commensurate with the claims. Currently cited prior art meets the structural limitations of the claim and applicant has not presented sufficient evidence that the structure of the prior art does not anticipate the invention as claimed. Applicant argues that a reaction phase is formed between a substrate and a first phase but no reaction product is claimed. If the reaction product is a critical feature of the invention it should be included in the

independent claim. "A claim that omits an element which applicant describes as an essential or critical feature of the invention originally disclosed does not comply with the written description requirement." See Gentry Gallery, 134 F.3d at 1480, 45 USPQ2d at 1503; In re Sus, 306 F.2d 494, 504, 134 USPQ 301, 309 (CCPA 1962).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elizabeth D. Ivey

JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER
6/15/06